

REMARKS

Claims 1-19 are pending in this application. Claims 1-19 remain in this application. Claims 1, 2, 14, 16 and 19 are amended. The Examiner is respectfully requested to enter the amendments set forth above and the following remarks into the record.

I. Rejection of Claims Under 35 U.S.C. 112

Claims 14-18 stand rejected as failing to comply with the written description requirement. These claims were rejected because the Examiner found that claim 14 as amended recites that the second culture compartment of the claimed system includes both "a membrane carrier" with a membrane and "an outlet filter" that was not supported in the originally filed disclosure.

Claim 14 has been amended to remove the "outlet filter." Applicants suggest that claim 14 as amended is supported by the originally filed disclosure, for example one embodiment of the invention of claim 14 is shown in Figure 7 of the present application. Claims 15-18 depend on claim 14 or one of its other dependent claims.

II. Rejection of Claims Under 35 U.S.C. 102

The Examiner rejected claims 1-4 and 7-9 under 35 U.S.C. 102(b) as being anticipated by Masahide et al. (JP 06-134210).

Independent Claim 1

Masahide et al. teaches a device for the deaeration of raw water. In order to increase the production of deaerated water, without increasing the vacuum or power requirements, different portions of a water stream are treated by passing each portion through a single deaeration film element. For example in Figure 1, a portion of raw water from a raw water port 1 is fed into a first deaeration element 3 where it is deaerated and then discharged through the water bypass 8 to outlet 2; whereas the remainder portion of the raw water from port 1 passes through a water flow bypass 6 formed inside the first deaeration element through the second deaeration element 4 and is discharged through outlet 2. The device is designed so that water only passes through one deaeration device before being discharged.

In contrast, the invention claimed in claim 1 (illustrated in Figure 7) is designed such that the fluid entering the fluid inlet passes through the first culture compartment, the connector filter, the fluid connector through bore, and the outlet filter. Thus, in the present invention the first culture compartment is in fluid communication with the second culture compartment.

Masahide, et al. does not have a **connector filter** positioned to filter fluid passing from the first culture compartment into the through bore of the fluid connector and into the second culture compartment. The Examiner has indicated that Masahide, et al. has “a connector filter (12) (See Figure 12 and 13 and paragraph [0013] of the English language machine translation.” The Examiner’s interpretation of a connector filter is confusing, as Figure 12 illustrates a hollow fiber deaeration membrane element and Figure 13 illustrates a spiral mold degassing membrane element. These are types of degassing membrane elements used in the device shown in the other figures. Figures 12 and 13 show a single deaeration element (without the water bypass passage) and do not show a first and second culture compartment coaxially aligned. None of the types of filters illustrated by Masahide, et al. are shown positioned between a first and second culture compartment that filters the fluid passing from one compartment to the other compartment.

In addition, paragraph [0013] of the English language machine translation describes the device shown in Figure 2. A copy of Figure 2 of Masahide, et al. is attached hereto as Attachment “A” and the raw water flow is highlighted. The raw water enters inlet 1 and a portion of the water (highlighted in pink) enters deaeration element 3. The distal end of deaeration element 3 diverts all of the deaerated water leaving the deaeration element 3 through the degassed water bypass passage 8 that runs through the deaeration element 4 (the water in the bypass passage does enter the deaeration element). Whereas, a second portion of the incoming raw water (highlighted in orange) enters inlet 1 and passes through the raw water bypass passage 6 in the first deaeration element 3 and is directed to enter the second deaeration element 4. The degassed water from the deaeration element 3 is only combined with the degassed water from the deaeration element 4 after they have passed through the deaeration elements and just before they pass out the degassed water outlet 2. **There is no fluid communication between deaeration elements 3 and 4 and there is no fluid filter between two axially aligned culture compartments that filters fluid going from one compartment to another compartment.**

In fact the major problem addressed by Masahide, et al. is how to divert the raw water flow through several shorter deaeration units to maintain the efficiency of the unit without having to increase the vacuum or power required to operate the unit. In contrast to the present invention, it is important to Masahide's invention that the fluid flow entering each deaeration unit is separated and is only deaerated in one deaeration unit.

III. Rejection of Claims Under 35 U.S.C. 103(a)

Independent Claim 19

The Examiner rejected independent claim 19 under 135 U.S.C. 103(a) as being unpatentable over Masahide, et al. in view of Schwarz et al. (U.S. 5,026,650).

Applicant traverses the rejection for the reasons discussed below.

A. Masahide, et al. (JP 06-134210)

Masahide, et al. has been discussed above. Masahide, et al. does not disclose a culture system having culture modules in a common fluid supply circuitry. **Thus, Masahide, et al. do not disclose a fluid connector that “directs fluid from the first culture compartment to the second culture compartment” as recited in claim 19 (e), nor a connector filter “to filter a fluid stream passing out of the first culture compartment and into the through bore of the fluid connector” as recited in claim 19(f).**

B. Schwarz, et al. (U.S. 5,026,650)

The Examiner found that the reference of Schwartz et al. discloses that it is known in the art to provide a membrane bioreactor using a single tubular membrane provided on a membrane support (Figs. 1-3).

The bioreactor of Schwartz, et al. has a central support member (32) with an oxygen permeable membrane (40) disposed over the central support member. See column 5, lines 36-38. In contrast, the present invention has a molecular weight cut-off membrane as opposed to an oxygen permeable membrane. The membrane 40 described by Schwartz, et al. “operates under air pressure

to permit oxygen to permeate through the wall of the membrane and carbon dioxide to diffuse in the opposite direction.” See column 5, lines 43-53. The invention of Schwartz, et al. would not work if liquid or media could penetrate the membrane. If media could penetrate membrane 40 the media would diffuse out of the annulus of fluid medium surrounding the membrane without being replenished. Thus, Schwartz, et al. actually teaches away from the use of a molecular weight cut-off membrane.

Furthermore, the air passageway of Schwartz, et al. through “the annular space between the inner wall of the membrane 40 and the outer wall of the central support member 32” is not in fluid communication with the through bore of a fluid connector as claimed in claim 19(i). Furthermore, **Schwartz, et al. does not have a fluid connector that “directs fluid from the first culture compartment to the second culture compartment” as recited in claim 19 (e), nor a connector filter “to filter a fluid stream passing out of the first culture compartment and into the through bore of the fluid connector” as recited in claim 19(f).**

C. Combination of Masahide, et al. and Schwartz, et al.

To establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Furthermore, the prior art must teach or suggest all claim limitations.

First of all there is no suggestion or motivation to combine the independent deaeration elements 3 and 4 of Masahide, et al. with the central support member 32 with the oxygen permeable membrane 40 of Schwartz, et al. In fact, even if one wanted to place the central support member 32 with an oxygen permeable membrane of Schwartz, et al. into the deaeration element 3 or 4 of Masahide, et al.; it is unclear how or where one could insert the central support member.

In addition, neither the Masahide patent nor the Schwartz patent describe a fluid connector or a connector filter as set forth in claim 19. Since neither patent teaches a fluid connector or connector filter, then the combination of the two patents does not teach a fluid connector or connector filter as claimed in claim 19.

D. Dependent Claims

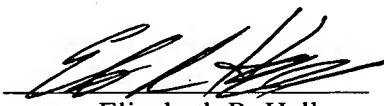
Claims 2-13 depend on claim 1 or one of its other dependent claims. Since each of these dependent claims contain all of the limitations of their respective independent claims, the Examiner's rejection of claims 2-13 is obviated for the reasons set forth above.

IV. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that Applicant has responded in a fully satisfactory manner to all matters at issue in this Office Action. If the Examiner has any questions or suggestions concerning the application, or feels that an interview would advance the examination process, the Examiner is requested to call the Applicant's undersigned attorney at the direct dial number printed below.

Respectfully submitted,

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